

LOW-TEMPERATURE GROWN HIGH QUALITY ULTRA-THIN CoTiO₃ GATE
DIELECTRICS

ABSTRACT

A gate oxide and method of fabricating a gate oxide that produces a more reliable and thinner equivalent oxide thickness than conventional SiO₂ gate oxides are provided. Gate oxides formed from alloys such as cobalt-titanium are thermodynamically stable such that the gate oxides formed will have minimal reactions with a silicon substrate or 5 other structures during any later high temperature processing stages. The process shown is performed at lower temperatures than the prior art, which inhibits unwanted species migration and unwanted reactions with the silicon substrate or other structures. Using a thermal evaporation technique to deposit the layer to be oxidized, the underlying substrate surface smoothness is preserved, thus providing improved and more consistent 10 electrical properties in the resulting gate oxide.

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